

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 09 August 2002 (09.08.02)	
<b>International application No.</b> PCT/US01/24587	<b>Applicant's or agent's file reference</b> 0035-ET-PCT
<b>International filing date</b> (day/month/year) 02 August 2001 (02.08.01)	<b>Priority date</b> (day/month/year) 03 August 2000 (03.08.00)
<b>Applicant</b> SCHMITT, Jerome et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
 31 January 2002 (31.01.02)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b> Zakaria EL KHODARY Telephone No.: (41-22) 338.83.38
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## PATENT COOPERATION TREATY

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## NOTIFICATION OF ELECTION

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From the INTERNATIONAL BUREAU

To:

Commissioner  
US Department of Commerce  
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2011 South Clark Place Room  
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Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 15 February 2001 (15.02.01)	
<b>International application No.</b> PCT/SE00/01173	<b>Applicant's or agent's file reference</b> Case 3135
<b>International filing date</b> (day/month/year) 07 June 2000 (07.06.00)	<b>Priority date</b> (day/month/year) 10 June 1999 (10.06.99)
<b>Applicant</b> NILSSON, Tomas	

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

29 December 2000 (29.12.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Claudio Borton

Telephone No.: (41-22) 338.83.38

## TENT COOPERATION TRE

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

To:

BJERNDELL, Per  
Trelleborg AB  
P.O. Box 153  
S-231 22 Trelleborg  
SUÈDE

<b>Date of mailing</b> (day/month/year) 23 October 2001 (23.10.01)	<b>IMPORTANT NOTIFICATION</b>
<b>Applicant's or agent's file reference</b> Case 3135	
<b>International application No.</b> PCT/SE00/01173	<b>International filing date</b> (day/month/year) 07 June 2000 (07.06.00)

## 1. The following indications appeared on record concerning:

☒ the applicant      ☐ the inventor      ☐ the agent      ☐ the common representative

<b>Name and Address</b> TRELLEBORG INDUSTRI AB S-231 81 Trelleborg Sweden	<b>State of Nationality</b> SE	<b>State of Residence</b> SE
	<b>Telephone No.</b>	
	<b>Facsimile No.</b>	
	<b>Teleprinter No.</b>	

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person      ☒ the name      ☒ the address      ☐ the nationality      ☐ the residence

<b>Name and Address</b> TRELLEBORG AB P.O. Box 153 S-231-22 Trelleborg Sweden	<b>State of Nationality</b> SE	<b>State of Residence</b> SE
	<b>Telephone No.</b>	
	<b>Facsimile No.</b>	
	<b>Teleprinter No.</b>	

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b>  Athina NICKITAS-ETIENNE  Telephone No.: (41-22) 338.83.38
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## TENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

To:

BJERNDELL, Per  
Trelleborg AB  
P.O. Box 153  
S-231 22 Trelleborg  
SUÈDE

Date of mailing (day/month/year) 23 October 2001 (23.10.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference Case 3135	
International application No. PCT/SE00/01173	International filing date (day/month/year) 07 June 2000 (07.06.00)

## 1. The following indications appeared on record concerning:

☒ the applicant    ☐ the inventor    ☐ the agent    ☐ the common representative

Name and Address TRELLEBORG INDUSTRI AB S-231 81 Trelleborg Sweden	State of Nationality SE	State of Residence SE
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person    ☒ the name    ☒ the address    ☐ the nationality    ☐ the residence

Name and Address TRELLEBORG AB P.O. Box 153 S-231-22 Trelleborg Sweden	State of Nationality SE	State of Residence SE
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Athina NICKITAS-ETIENNE
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

## CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)

Applicant(s): NILSSON, Tomas

Docket No.

JUL 10 2001 PCT/PTO 06 DEC 2001  
1987-A-PCT-US

Serial No. Not yet known	Filing Date Filed Herewith	Examiner	Group Art Unit
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Invention: TIRE DEVICE

I hereby certify that the following correspondence:

Notification of Recording of Change of Name

(Identify type of correspondence)

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: The Assistant Commissioner for Patents, Washington, D.C. 20231

12/06/01  
(Date)

Fiona Ferguson

(Typed or Printed Name of Person Mailing Correspondence)

  
(Signature of Person Mailing Correspondence)

EL 038418984 US

("Express Mail" Mailing Label Number)

Note: Each paper must have its own certificate of mailing.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Case 3135	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE00/01173	International filing date (day month year) 07.06.2000	Priority date (day month year) 10.06.1999
International Patent Classification (IPC) or national classification and IPC7 B60C 5/16, B60C 15/02		
Applicant Trelleborg Industri AB et al		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>2</u> sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 29.12.2000	Date of completion of this report 10.09.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer  Göran Carlström/EK Telephone No. 08-782 25 00

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01173

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
 pages 1-5, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement) under article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages 6-7, filed with the letter of 23.05.2001
- ☒ the drawings:  
 pages 1, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheet/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01173

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	<u>1-8</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-8</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-8</u>	YES
	Claims		NO

**2. Citations and explanations (Rule 70.7)**

The claimed invention is not considered to be anticipated by the patent documents cited. None of these documents reveals the tyre device described in the claims.

The invention according to claims 1- 8 is therefore considered to be novel, to involve an inventive step and to be industrially applicable.

FR 2669276 A1 (CYCLES FARRAROLI-CH)

CH 336278 A (GEORG FISCHER AKTIENGESELLSCHAFT)

WO 9821056 A1 (PACEMARK, INC)



## CLAIMS

1. An arrangement relating to pneumatic tubeless tires that are fitted with a tire bead (12) in sealing abutment with a rim seat (13) inwardly from a rim edge (14) on each side of an undivided rim (11), characterised in that the tire is provided with an internal lip seal (16), which is made of rubber or some like elastic material and which extends along the rim seat (13) inwardly from the tire bead (12); in that the outer part of the internal seal (16) proximal to the rim edge (14) is fastened to the tire bead (12) at a distance from its end; in that the inner edge of the lip seal (16) rests on the rim (11); in that the inner part of the internal seal (16) proximal to the centre of the rim (11) has a circumference which is slightly smaller than the circumference of the rim (11) at this location; and in that the seal (16) is adapted to seal at least in the region of the abutment of the tire bead (12) with the rim seat (13) through the influence of the pneumatic pressure in the tire (10).
2. An arrangement according to Claim 1, characterised in that the outer part of the lip seal (16) is glued to the tire rim (2).
3. An arrangement according to Claim 1 or 2, characterised in that the lip seal (16) comprises a material of such softness as to cause the seal to lie in sealing abutment with its underlying supporting surface essentially along the whole of the extension of the seal.
4. An arrangement according to Claim 1 or 2, characterised in that the lip seal (16) is comprised of a relatively rigid elastic material and is adapted to lie in sealing abutment with the rim (11) at least at the inward part of said seal.
5. An arrangement according to any one of Claims 1-4, characterised in that the lip seal (16) is fastened with the edge of its outer part spaced from the end of the tire bead (12) by at least 50-70 mm.

2 3 -05- 2001

7

6. An arrangement according to any one of Claims 1-5, characterised in that the lip seal (16) has a skirt-like configuration with the inner part of said seal resting loosely on the rim (11).

5 7. An arrangement according to any one of Claims 1-6, characterised in that the inner edge of the lip seal (16) has the form of a so-called selvage.

8. The use of the arrangement according to Claims 1-7 in low profile tires, preferably low profile tires intended for forestry service.

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Ink. t. Patent- och  
registreringsverket

PCT

2000-06-07

REQUEST

Första Poster:

The undersigned requests that the present  
international application be processed  
according to the Patent Cooperation Treaty.

For receiving Office use only

PCT/ SE 00 / 01173

International Application No.

07-06-2000

International Filing Date

The Swedish Patent Office

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference

(if desired) (12 characters maximum) Case [3131] 3135

RC/SE

Box No. I TITLE OF INVENTION

20/SE  
Anordning vid däck Tyre device

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Trelleborg Industri AB  
SE-231 81 Trelleborg  
Sweden

☐ This person is also inventor.

Telephone No.

+46 410 510 00

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

SE

State (that is, country) of residence:

SE

This person is applicant  
for the purposes of:

☐ all designated  
States

☒ all designated States except  
the United States of America

☐ the United States  
of America only

☐ the States indicated in  
the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

NILSSON, Tomas  
Brogatan 13  
SE-211 44 Malmö  
Sweden

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box  
is marked, do not fill in below.)

State (that is, country) of nationality:

SE

State (that is, country) of residence:

SE

This person is applicant  
for the purposes of:

☐ all designated  
States

☐ all designated States except  
the United States of America

☒ the United States  
of America only

☐ the States indicated in  
the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf  
of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

BJERNDÉLL, Per  
Trelleborg AB  
P.O. Box 153  
SE-231 22 Trelleborg  
Sweden

Telephone No.

+46 410 670 00

Facsimile No.

+46 410 439 72

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> <b>AE</b> United Arab Emirates                  | <input checked="" type="checkbox"/> <b>LR</b> Liberia                                   |
| <input checked="" type="checkbox"/> <b>AL</b> Albania                               | <input checked="" type="checkbox"/> <b>LS</b> Lesotho                                   |
| <input checked="" type="checkbox"/> <b>AM</b> Armenia                               | <input checked="" type="checkbox"/> <b>LT</b> Lithuania                                 |
| <input checked="" type="checkbox"/> <b>AT</b> Austria                               | <input checked="" type="checkbox"/> <b>LU</b> Luxembourg                                |
| <input checked="" type="checkbox"/> <b>AU</b> Australia                             | <input checked="" type="checkbox"/> <b>LV</b> Latvia                                    |
| <input checked="" type="checkbox"/> <b>AZ</b> Azerbaijan                            | <input checked="" type="checkbox"/> <b>MA</b> Morocco                                   |
| <input checked="" type="checkbox"/> <b>BA</b> Bosnia and Herzegovina                | <input checked="" type="checkbox"/> <b>MD</b> Republic of Moldova                       |
| <input checked="" type="checkbox"/> <b>BB</b> Barbados                              | <input checked="" type="checkbox"/> <b>MG</b> Madagascar                                |
| <input checked="" type="checkbox"/> <b>BG</b> Bulgaria                              | <input checked="" type="checkbox"/> <b>MK</b> The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> <b>BR</b> Brazil                                | <input checked="" type="checkbox"/> <b>MN</b> Mongolia                                  |
| <input checked="" type="checkbox"/> <b>BY</b> Belarus                               | <input checked="" type="checkbox"/> <b>MW</b> Malawi                                    |
| <input checked="" type="checkbox"/> <b>CA</b> Canada                                | <input checked="" type="checkbox"/> <b>MX</b> Mexico                                    |
| <input checked="" type="checkbox"/> <b>CH and LI</b> Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> <b>NO</b> Norway                                    |
| <input checked="" type="checkbox"/> <b>CN</b> China                                 | <input checked="" type="checkbox"/> <b>NZ</b> New Zealand                               |
| <input checked="" type="checkbox"/> <b>CR</b> Costa Rica                            | <input checked="" type="checkbox"/> <b>PL</b> Poland                                    |
| <input checked="" type="checkbox"/> <b>CU</b> Cuba                                  | <input checked="" type="checkbox"/> <b>PT</b> Portugal                                  |
| <input checked="" type="checkbox"/> <b>CZ</b> Czech Republic                        | <input checked="" type="checkbox"/> <b>RO</b> Romania                                   |
| <input checked="" type="checkbox"/> <b>DE</b> Germany                               | <input checked="" type="checkbox"/> <b>RU</b> Russian Federation                        |
| <input checked="" type="checkbox"/> <b>DK</b> Denmark                               | <input checked="" type="checkbox"/> <b>SD</b> Sudan                                     |
| <input checked="" type="checkbox"/> <b>DM</b> Dominica                              | <input checked="" type="checkbox"/> <b>SE</b> Sweden                                    |
| <input checked="" type="checkbox"/> <b>EE</b> Estonia                               | <input checked="" type="checkbox"/> <b>SG</b> Singapore                                 |
| <input checked="" type="checkbox"/> <b>ES</b> Spain                                 | <input checked="" type="checkbox"/> <b>SI</b> Slovenia                                  |
| <input checked="" type="checkbox"/> <b>FI</b> Finland                               | <input checked="" type="checkbox"/> <b>SK</b> Slovakia                                  |
| <input checked="" type="checkbox"/> <b>GB</b> United Kingdom                        | <input checked="" type="checkbox"/> <b>SL</b> Sierra Leone                              |
| <input checked="" type="checkbox"/> <b>GD</b> Grenada                               | <input checked="" type="checkbox"/> <b>TJ</b> Tajikistan                                |
| <input checked="" type="checkbox"/> <b>GE</b> Georgia                               | <input checked="" type="checkbox"/> <b>TM</b> Turkmenistan                              |
| <input checked="" type="checkbox"/> <b>GH</b> Ghana                                 | <input checked="" type="checkbox"/> <b>TR</b> Turkey                                    |
| <input checked="" type="checkbox"/> <b>GM</b> Gambia                                | <input checked="" type="checkbox"/> <b>TT</b> Trinidad and Tobago                       |
| <input checked="" type="checkbox"/> <b>HR</b> Croatia                               | <input checked="" type="checkbox"/> <b>TZ</b> United Republic of Tanzania               |
| <input checked="" type="checkbox"/> <b>HU</b> Hungary                               | <input checked="" type="checkbox"/> <b>UA</b> Ukraine                                   |
| <input checked="" type="checkbox"/> <b>ID</b> Indonesia                             | <input checked="" type="checkbox"/> <b>UG</b> Uganda                                    |
| <input checked="" type="checkbox"/> <b>IL</b> Israel                                | <input checked="" type="checkbox"/> <b>US</b> United States of America                  |
| <input checked="" type="checkbox"/> <b>IN</b> India                                 | <input checked="" type="checkbox"/> <b>UZ</b> Uzbekistan                                |
| <input checked="" type="checkbox"/> <b>IS</b> Iceland                               | <input checked="" type="checkbox"/> <b>VN</b> Viet Nam                                  |
| <input checked="" type="checkbox"/> <b>JP</b> Japan                                 | <input checked="" type="checkbox"/> <b>YU</b> Yugoslavia                                |
| <input checked="" type="checkbox"/> <b>KE</b> Kenya                                 | <input checked="" type="checkbox"/> <b>ZA</b> South Africa                              |
| <input checked="" type="checkbox"/> <b>KG</b> Kyrgyzstan                            | <input checked="" type="checkbox"/> <b>ZW</b> Zimbabwe                                  |
| <input checked="" type="checkbox"/> <b>KP</b> Democratic People's Republic of Korea |   |
| <input checked="" type="checkbox"/> <b>KR</b> Republic of Korea                     |   |
| <input checked="" type="checkbox"/> <b>KZ</b> Kazakhstan                            |   |
| <input checked="" type="checkbox"/> <b>LC</b> Saint Lucia                           |   |
| <input checked="" type="checkbox"/> <b>LK</b> Sri Lanka                             |   |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☐ .....
- ☐ .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

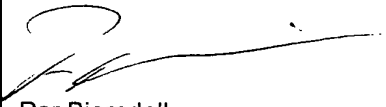

<b>Box No. VI PRIORITY CLAIM</b>		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 10 June 1999 (10-06-1999)	9902170-1	Sweden		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office identified above as item(s): 1

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

<b>Box No. VII INTERNATIONAL SEARCHING AUTHORITY</b>			
<b>Choice of International Searching Authority (ISA)</b> (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		<b>Request to use results of earlier search; reference to that search</b> (if an earlier search has been carried out by or requested from the International Searching Authority):	
ISA / SE		Date (day/month/year) 10 June 1999	Number SE 99/00965
		Country (or regional Office) Sweden	

<b>Box No. VIII CHECK LIST; LANGUAGE OF FILING</b>	
This international application contains the following number of sheets: request : 3 ✓ description (excluding sequence listing part) : 5 ✓ claims : 2 ✓ abstract : 1 ✓ drawings : 1 ✓ sequence listing part of description : Total number of sheets : 12	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: GF 50/92 4. <input checked="" type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): ITS report
Figure of the drawings which should accompany the abstract: 2	Language of filing of the international application: Swedish

<b>Box No. IX SIGNATURE OF APPLICANT OR AGENT</b>	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).	
 Per Bjernedell Agent for the Applicants	 Tomas Nilsson Inventor

For receiving Office use only	
1. Date of actual receipt of the purported international application:	07-06-2000
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	2. Drawings: <input checked="" type="checkbox"/> received:  <input type="checkbox"/> not received:
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA / SE	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

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Date of receipt of the record copy by the International Bureau:	27 JULY 2000 (27.07.00)

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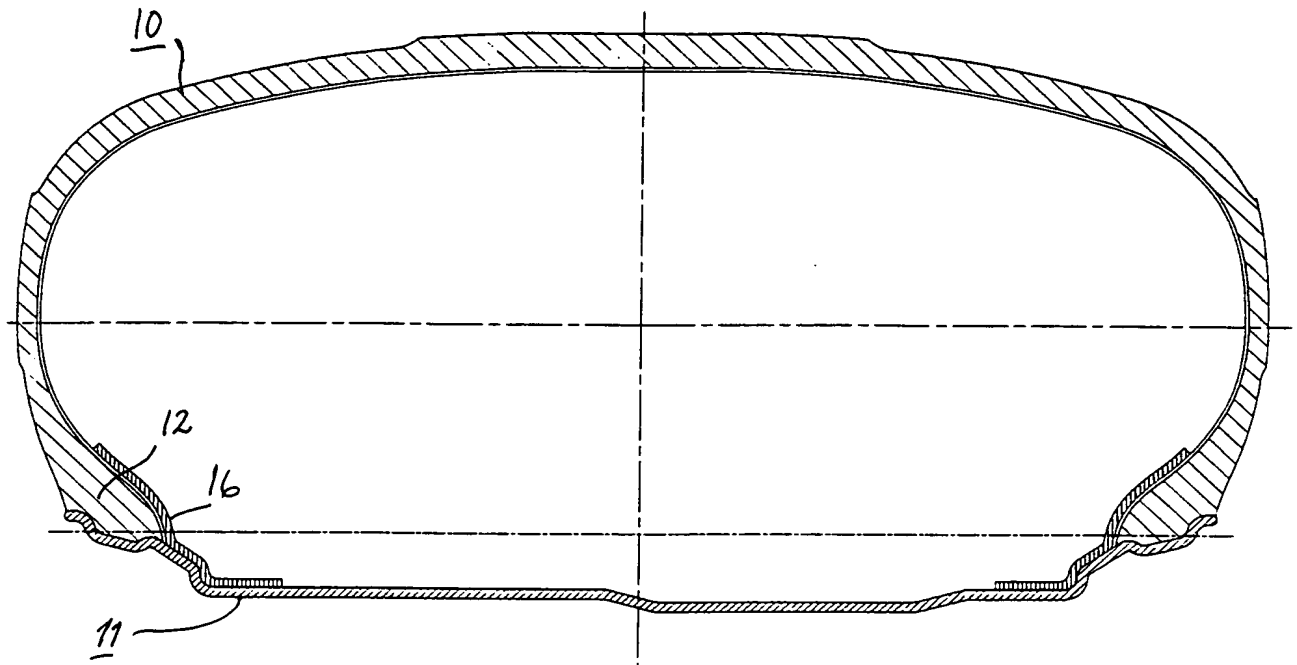


Fig 2

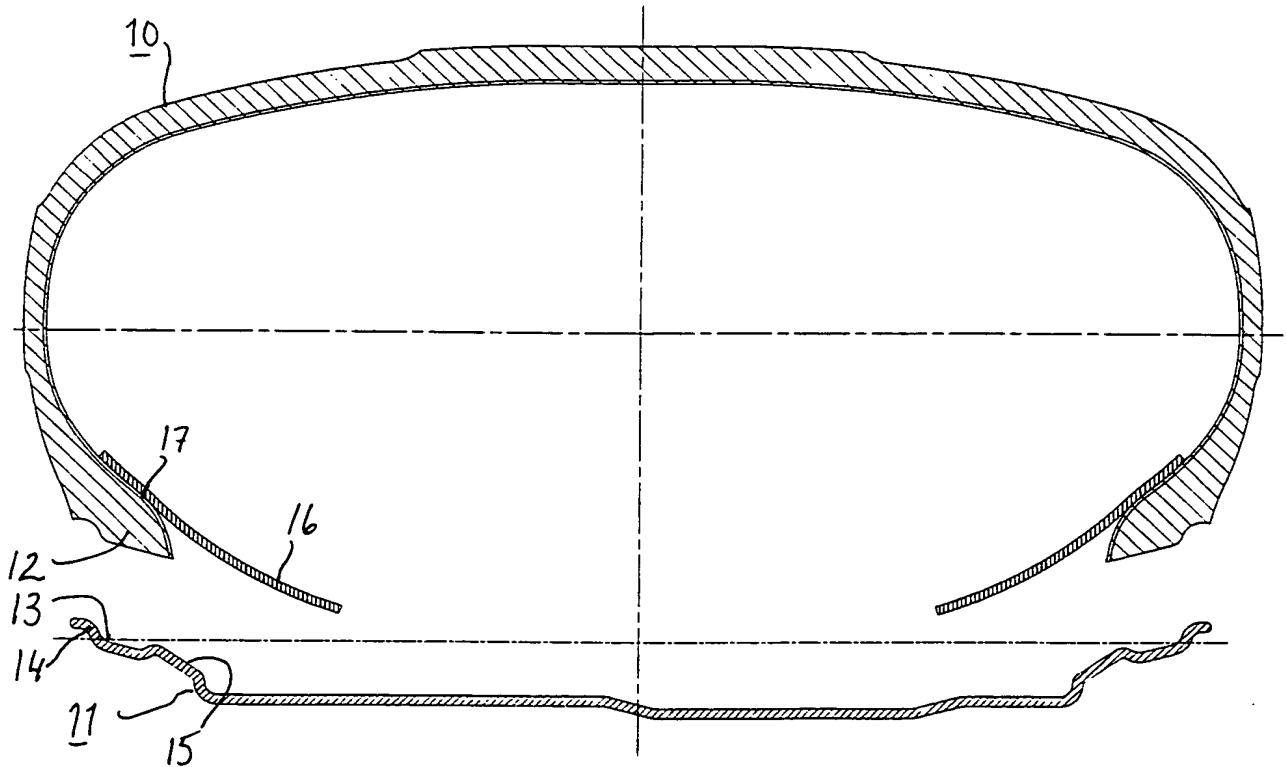


Fig. 1

## ANORDNING VID DÄCK

## TYRE DEVICE

Uppfinningen avser en anordning vid pneumatiska slanglösa däck, vilka är monterade med en däckfot anliggande tätande mot ett fälgsäte inåt från ett fälghörn på vardera sidan av en odelad fälg. Uppfinningen är särskilt lämplig för att möjliggöra användning av slanglösa däck på fordon för skogsservice, vilka kan vara skogsfordon eller skogsmaskiner, särskilt sådana som är utrustade med boggie.

10

I dag används slangförsedda däck för skogsservicebruk och liknande användningsmässigt avancerade ändamål, eftersom pneumatiska slanglösa däck, dvs pumpade däck utan innerslang, tappar luft vid sådan kraftigt mekanisk påfrestning som ej kan undvikas vid körning i så oländig terräng som oftast är fallet i skogen, exempelvis i hyggen och liknande. Orsaken är att dels uppkommer kraftiga sidledes rörelser vid kurvtagning speciellt hos boggieförsedda fordon, så att däcksidorna trycks in vid kontakt med stenar, stockar och dylika hinder i terrängen, varvid i båda fallen däckfoten, dvs den mot fälgsätet tätande delen av däckets kan tryckas loss från fälgsätet under längre eller kortare tid. Härvid kommer luften momentant att läcka ut ur däckets. Detta sker så ofta att ett kort arbetspass kan räcka för att däckets skall tappa så mycket luft att dess funktion som däck förloras. Detta problem är som inses inte aktuellt vid slangförsedda däck, varför så vitt vi känner till uteslutande sådana däck kommer till användning för skogsservice.

20

De slangförsedda däcken uppfyller dock inte dagens krav på hög produktivitet och begränsade kostnader i skogsarbetet, eftersom slangförsedda däck är känsliga för nypningar i däcksidorna vid passage över stenar och stubbar, vilket orsakar ofta återkommande punkteringar i slangarna som medför avbräck för användarna i form av höga kostnader för däckbyten och upprepade stillestånd på grund av reparationsbehov. Dessa problem är speciellt besvärliga vid däck med extrem lågprofil, vilka är de vanligaste och mest ändamålsenliga för skogsarbeten. Slangarna i lågprofildäck kan av tillverkningsskäl nämligen inte åstadkommas med

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optimal profil/tvärsektion, vilket innebär extra höga sträckningsnivåer på mer än 50% mot normalt 30%. Denna höga sträckning medför mycket stor känslighet för problem med nypning och även för problem orsakade av utmattning.

- 5 Det har tidigare föreslagits olika lösningar på problem av liknande art vid slanglösa däck, men inget av hittills föreslagna kända lösningar har kunnat användas för däck avsedda för skogsservice eller liknande avancerade terrängapplikationer. Gemensamt för de kända lösningarna är att de främst är inriktade på att mekaniskt trycka an däckfoten mot fälgsätet, men de är sinsemellan ganska olika.

10

Således föreslås i US-A-2,731,063 en insatsring som i princip är tillverkad av en gummiöverdragen metallring och avpassad att trycka an respektive däckfot på ömse sidor av ringen mot fälgen, vilken i detta fall är en delad fälg. Det ena fälghornet är härvid avtagbart, så att insatsringen kan skjutas in på fälgsätet med  
15 fälghornet borttaget och som därefter apteras så att ringen kläms åt mellan de båda däckfötterna och fälghornen. En sådan insatsring kan naturligtvis inte monteras för att användas på odelade fälgar, vilket är föremål för uppfinningen enligt ansökan.

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I DE-B- 1 024 384 föreslås utnyttjande av ringformiga slutna membran som förbinds med däckfoten så att membranet ligger vikt runt denna och trycks fast mellan däckfot och fälgsäte. Membranet viks över sig självt dubbelt innanför däckfoten och trycks därvid av däcktrycket ned mot fälgens mittbana. Denna anordning är avsedd för bildäck och torde inte vara användbar för tyngre däck, eftersom membranet snabbt kommer att slitas sönder vid de kraftiga påfrestningar  
25 mellan däckfot och fälg som förekommer vid tyngre däck. En liknande konstruktion föreslås för cykeldäck i WO 98/21056 med samma problem vid användning för tyngre däck.

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Slutligen föreslås i DE-A- 2 356 097 användning av en uppblåsbar ringformig så kallad trycksäck, vilken blåses upp separat när den applicerats på plats. Denna anordning avses främst för däck med stor diameter, vilka används för lantbruk och



gatuarbeten, som skall överföra stora vridmoment och för vilka det normala lufttrycket inte räcker för att hindra däckets att kana på fälgen.

5 Syftet med uppfinningen är att erbjuda en anordning vid pneumatiska slanglösa däck som eliminerar de problem med luftläckage hos sådana som uppstår som följd av körning i oländig terräng med mekanisk påverkan från hinder i form av stenar, stubbar och diken.

10 I detta syfte har uppfinningen de drag som återfinns i de tillhörande patentkraven.

Däcket är således enligt uppfinningen försett med en från däckfoten inåt längs fälgsätet sig sträckande invändig läpptätning av gummi eller liknande elastiskt material. Den invändiga tätningen är i sin yttre mot fälghornet vettande del fäst på däckfoten på avstånd från dess ände. Den invändiga tätningen har i sin inre mot fälgens centrum vettande del en omkrets något mindre än fälgens omkrets på detta ställe och tätningen är avpassad att genom inverkan av det pneumatiska trycket i däckets täta åtminstone i området kring däckfotens anliggning mot fälgsätet.

20 Den invändiga läpptätningen är lämpligen i sin yttre del fäst på däckfoten medelst limning, men kan även vara fastsatt på annat sätt som ombesörjer kvarhållande av tätningen mot däckfoten. Fogen mellan tätningen och däckfoten behöver således inte nödvändigtvis vara tätande i sig själv.

25 För läpptätningen väljs företrädesvis ett så mjukt material att tätningen bringas anligga tätande mot underlaget i väsentligen hela sin utsträckning, när den efter uppumpning av däckets utsätts för det i dess inre rådande pneumatiska trycket.

Läpptätningen kan dock alternativt vara tillverkat av ett relativt styvt elastiskt material och avpassad att åtminstone i sin inre del anligga tätande mot fälgen. 30 Tätningen anligger i detta fall inte alltid i hela sin längd mot underlaget utan främst i sina ändpartier. Detta kan vara lämpligt vid extremt höga tryck i däckets.

Läpptätningen är lämpligen fastsatt med kanten hos sin yttre del på ett avstånd cirka 50-70 mm från däckfotens ände.

- 5    Läpptätningen har oftast en kjolliknande form med sin inre del löst vilande mot fälgen, och däckets kallas även internt för "kjoldäck", men det ligger inom ramen för uppfinningen att utforma tätningen på annat sätt och även att fästa den inre delen mot fälgen på motsvarande sätt som mot däckfoten om så skulle visa sig önskvärt av olika skäl. Läpptätningens inre kant kan exempelvis vara utformad som
- 10    en stadkant, som spänner mot fälgen och kan vara limmad eller på annat sätt fastsatt vid denna.

- Anordningen enligt uppfinningen kan med fördel användas vid lågprofildäck, särskilt sådana som används på skogsfordon eller skogsmaskiner med boggier, men
- 15    är generellt användbar för alla typer av slanglösa däck.

- Uppfinningen skall nu ytterligare beskrivas med hänvisning till tillhörande ritning, där figur 1 visar ett tvärsnitt av ett däck och tillhörande fälg i omonterat tillstånd, figur 2 samma tvärsnitt av det monterade däckets i pumpat tillstånd.

- 20    Figur 1 visar ett slanglöst däck 10 och en fälg 11 i omonterat skick för åskådliggörelse. Fälgen 11 har ett fälgsäte 13, ett fälghorn 14 och en vulst 15 på vardera sidan om dess centrumdel. Däcket 10 har en däckfot 12 avsedd att i monterat tillstånd anligga mot fälgsätet 13 från fälghornet 14 till vulsten 15 och
- 25    därmed täta mot fälgen 11 så att den luft som pumpas i däckets 10 kommer att kvarhållas. På däckfoten 12 finns en läpptätning 16 anbringad som är limmad eller på annat sätt förbunden till däckfoten 12 i området 17. I figuren illustreras uppfinningen med en fälg 11 försedd med en vulst 15, men det helt ligger inom uppfinningens ram att använda fälgar även utan sådan vulst.

- 30    Figur 2 visar däckets 10 och fälgen 11 i monterat och uppblåst tillstånd. Härvid påverkar lufttrycket inne i däckets 10 läpptätningen 16 att ligga lufttätt an mot

fälgen 11 i området utanför fälgsätet 13, dvs mot vulsten 15 och de innanför denna mot fälgens 11 centrum vettande belägna delarna av fälgen 11.

Om det vid körning med däck 10 inträffar att däckfoten 12 på grund av yttre påverkan kommer att tryckas loss inåt från fälgsätet 13 under kortare eller längre tid kommer läpptätningen 16 fortfarande att genom det inre lufttrycket i däck 10 anligga mot såväl däckfoten 12 som fälgen 11 och därvid täta igen eventuell glipa mellan dessa. Om främmande föremål, träflis, stenar eller dylikt, skall kila sig fast mellan fälghornet 14 och däckfoten 12 och därmed bilda en mer permanent glipa däremellan tättar fortfarande läpptätningen 16 effektivt och hindrar därmed luften i däck 10 att läcka ut.

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# PATENTKRAV

1. Anordning vid pneumatiska slanglösa däck, vilka är monterade med en däckfot (12) anliggande tätande mot ett fölgsäte (13) inåt från ett fölghorn (14) på vardera sidan av en odelad fälg (11), k ä n n e t e c k n a d a v a t t däckets är försett med en från däckfoten (12) inåt längs fölgsätet (13) sig sträckande invändig läpptätning (16) av gummi eller liknande elastiskt material, att den invändiga tätningen (16) i sin yttre mot fölghornet (14) vettande del är fäst på däckfoten (12) på avstånd från dess ände, att den invändiga tätningen (16) i sin inre mot fälgens (11) centrum vettande del har en omkrets något mindre än fälgens (11) omkrets på detta ställe och att tätningen (16) är avpassad att genom inverkan av det pneumatiska trycket i däckets (10) täta åtminstone i området kring däckfotens (12) anliggning mot fölgsätet (13).

2. Anordning enligt krav 1, k ä n n e t e c k n a d a v a t t den invändiga läpptätningen (16) i sin yttre del är fäst på däckfoten (12) medelst limning.

3. Anordning enligt krav 1 eller 2, k ä n n e t e c k n a d a v a t t för läpptätningen (16) väljs ett så mjukt material att tätningen bringas anligga tätande mot underlaget i väsentligen hela sin utsträckning.

4. Anordning enligt krav 1 eller 2, k ä n n e t e c k n a d a v a t t läpptätningen (16) är av ett relativt styvt elastiskt material och avpassad att åtminstone i sin inre del anligga tätande mot fälgen (11).

5. Anordning enligt något av kraven 1-4, k ä n n e t e c k n a d a v a t t läpptätningen (16) är fastsatt med sin yttre dels kant cirka 50-70 mm från däckfotens (12) ände.

6. Anordning enligt något av kraven 1-5, k ä n n e t e c k n a d a v  
a t t läpptätningen (16) har en kjolliknande form med sin inre del löst vilande mot  
fälgen (11).

5 7. Anordning enligt något av kraven 1-6, k ä n n e t e c k n a d a v  
a t t läpptätningens (16) inre kant är utformad som en stadkant.

8. Användning av anordningen enligt kraven 1-7 för lågprofildäck,  
företrädesvis sådana för skogsservice

## SAMMANDRAG

- Anordning vid pneumatiska slanglösa däck, vilka är monterade med en däckfot
- 5 (12) anliggande tätande mot ett fälgsäte (13) inåt från ett fälghorn (14) på vardera sidan av en odelad fälg (11). Däcket är försett med en från däckfoten (12) inåt längs fälgsätet (13) sig sträckande invändig läpptätning (16) av gummi eller liknande elastiskt material och den invändiga tätningen (16) i sin yttre mot fälghornet (14) vettande del är fäst på däckfoten (12) på avstånd från dess ände.
- 10 Den invändiga tätningen (16) har i sin inre mot fälgens (11) centrum vettande del en omkrets något mindre än fälgens (11) omkrets på detta ställe. Tätningen (16) är avpassad att genom inverkan av det pneumatiska trycket i däcket (10) täta åtminstone i området kring däckfotens (12) anliggning mot fälgsätet (13).

## TIRE DEVICE

The invention relates to pneumatic tubeless tires, which are fitted with a bead that lies in tight, sealing abutment with a rim seat inwardly of a rim edge on each side of an undivided rim. The invention is particularly suitable for use with tubeless tires for forestry service vehicles, for instance forest vehicles or forest machines, particularly those that are equipped with a bogey.

At present, tires used with forestry service vehicles and with vehicles for similar advanced use include air-filled tubes, since pneumatic tubeless tires, i.e. tires inflated without the use of an inner tube, lose air as a result of the heavy mechanical stresses and strains to which they are unavoidably subjected when driving over rough terrain, such as those often encountered in forests, for instance in clear-felled areas and similar areas. One cause in this respect resides in the heavy lateral movements that occur when negotiating curves, particularly in the case of bogey-equipped vehicles, therewith causing the walls of the tires to be pressed into contact with stones, logs and like obstacles in the terrain, wherewith the tire bead, i.e. that part of the tire which is in abutment with the rim seat can, in both instances, be forced loose from the rim seat over a longer or shorter time period. This results in an instantaneous leakage of air from the tire, and occurs so often that a short working shift is sufficient for the tire to be deflated to such an extent as to lose its function as a tire. It will be realised that this problem does not apply to tube-equipped tires, and consequently such tires are used exclusively for forestry service use, as far as we are aware.

Tube-equipped tires, however, do not fulfil present-day requirements relating to high productivity and limited costs in forestry work, since tube-equipped tires are prone to be pinched in the sides of the tire when passing over stones, rocks and stubs, resulting in repeated puncturing of the tubes and also in financial losses on the part of the users, in the form of the costs entailed by tire changes and repeated idling times necessitated by repair requirements. These problems are particularly troublesome in the case of tires that have extremely low profiles, which are the most common and most expedient type of tire for forestry work. For reasons of a manufacturing nature, the tubes in low profiled tires cannot be produced with an optimal profile/cross-section, which involves extra high stretch levels of more than 50% against a normal 30%. This high degree of stretch exacerbates the tube pinching problem and also problems caused by fatigue.

Although various solutions to similar types of problems relating to tubeless tires have been proposed, none of these solutions has been found useful in respect of tires intended for forestry service or similar advanced terrain applications. Although the proposed solutions differ quite considerably from one another, a common primary feature of the solutions is directed towards pressing the tire bead mechanically against the rim seat.

For instance, US-A-2,731,063 proposes the use of an insert ring, principally in the form of a rubber-covered metal ring, adapted to press a respective tire bead against the tire rim on respective sides of the ring, said rim being a split ring in this particular case. In this case, one rim edge can be removed so as to enable the insert ring to be pushed in on the rim seat with the rim edge removed and thereafter adapted so as to clamp between the two tire beads and the rim edge. As will be understood, such an insert ring cannot be fitted to undivided rims, as distinct from the object of the present invention.

DE-B-1 024 384 proposes the use of a closed ring-shaped diaphragm or membrane which is connected to the bead of the tire so as to lie folded around the bead, and is pressed firmly between the bead and the rim seat. The diaphragm is folded double inwardly of the tire edge and therewith is pressed down against the central path of the rim by the tire pressure. This solution is intended for car tires and is not believed to be useful in the case of heavy tires, because the diaphragm will quickly be worn out when subjected to the heavy loads that are exerted between the edge of the tire and the rim in the case of heavier tires. WO 98/21056 proposes a similar construction for bicycle tires, with the same problems as those mentioned with the use of heavy tires.

Finally, DE-A-2 356 097 proposes the use of an inflatable ring-shaped so-called pressure bag which is inflated separately when placed in position. This solution is intended primarily for tires of large diameter used with agricultural appliances and road working appliances with which heavy torque shall be transferred and for which the normal air pressure is not sufficient to prevent the tire from sliding on the rim.

The object of the present invention is to provide a pneumatic tubeless tire arrangement with which problems caused by the leakage of air resulting from driving in rough terrain



and being subjected to the mechanical influence of obstacles such as stones, rocks, tree stubs, ruts and ditches, are eliminated.

This object is achieved with an inventive arrangement having the features set forth in the accompanying Claims.

Thus, the inventive tire is provided with a lip seal made of rubber or some similar elastic material that extends internally and inwardly from the bead of the tire and along the rim seat. That part of the internal seal that lies proximal to the edge of the rim is fastened to the tire bead at a distance from its end. The circumference of that part of the internal seal which lies proximal to the centre of the rim is somewhat smaller than the circumference of the rim at this position and the seal is adapted to seal at least in the region around the abutment of the tire bead with the rim seat by virtue of the action of the pneumatic pressure in the tire.

The outer part of the internal lip seal is suitably glued to the bead of the tire, although it may alternatively be fastened in some other way that will effectively hold the seal against the tire bead. Thus, the join between the seal and the tire bead need not be sealing in itself.

The lip seal will preferably be comprised of a material of such softness that the seal will lie sealingly against its supporting surface throughout essentially the whole of its extension when subjected to the pneumatic pressure prevailing in the tire when inflated.

Alternatively, the lip seal may be made of a relatively rigid elastic material and adapted so that at least its inward part will lie sealingly against the rim. In this case, the seal will not always lie against the underlying surface along the full length of the seal, but primarily only at its end portions. This can be suitable when tire pressures are extremely high.

The lip seal is conveniently fastened at its outer edge at a distance of about 50-70 mm from the end of the bead.

The lip seal will often have a skirt-like shape with its inner part resting loosely on the rim, such a tire also being referred internally to as a "skirt tire", although it lies within the scope of the invention to give the seal some other shape and also to fasten the inner part of the

seal to the rim in the same manner as it is secured to the bead of the tire should this be found desirable for some reason or another. The inner edge of the lip seal may be formed as a so-called selvage that stretches towards the rim and may be glued thereto or fastened in some other way.

5

The inventive arrangement may be used beneficially with low profile tires, particularly tires that are used on forestry vehicles or forestry machines equipped with bogeys, although it can also be used generally with all types of tubeless tires.

10 The invention will now be described in more detail with reference to the accompanying drawing, in which Figure 1 is a cross-sectional view of a tire and an associated rim in a non-assembled state; and Figure 2 is a similar cross-sectional view of an inflated tire assembly.

15 Figure 1 illustrates a tubeless tire 10 and a rim 11, which are shown in an unassembled state for the sake of illustration. The rim 11 includes a rim seat 13, a rim edge 14 and a ridge 15 on each side of its centre part. The tire 10 includes a bead 12 which when the tire is fitted lies against the rim seat 13 from the edge 14 of the rim to the ridge 15 and therewith seal against the rim 11 so that air pumped into the tire 10 will not escape therefrom. A  
20 lip seal 16 is glued or otherwise affixed to the bead 12 in the region 17 thereof. Although the illustrated embodiment of the invention includes a rim 11 that is provided with a ridge 15, it will be understood that rims which lack such a ridge may also be used within the scope of the invention.

25 Figure 2 shows the tire 10 and the rim 11 assembled and the tire inflated. The air pressure inside the tire 10 causes the lip seal 16 to lie sealingly against the rim 11 in the region outwardly of the rim seat 13, i.e. towards the ridge 15 and the inwardly located parts of the rim 11 facing towards the centre of said rim.

30 Should the bead 12 of the tire be loosened inwardly from the rim seat 13 as a result of external forces for a shorter or longer period of time, the air pressure in the tire 10 will cause the lip seal 16 to remain in abutment with both the bead 12 and the rim 11 and therewith reseal any gap that may occur therebetween. If an object, such as a wood chip, stone or the like, wedge between the edge 14 of the rim and the bead 12 and therewith result in a more

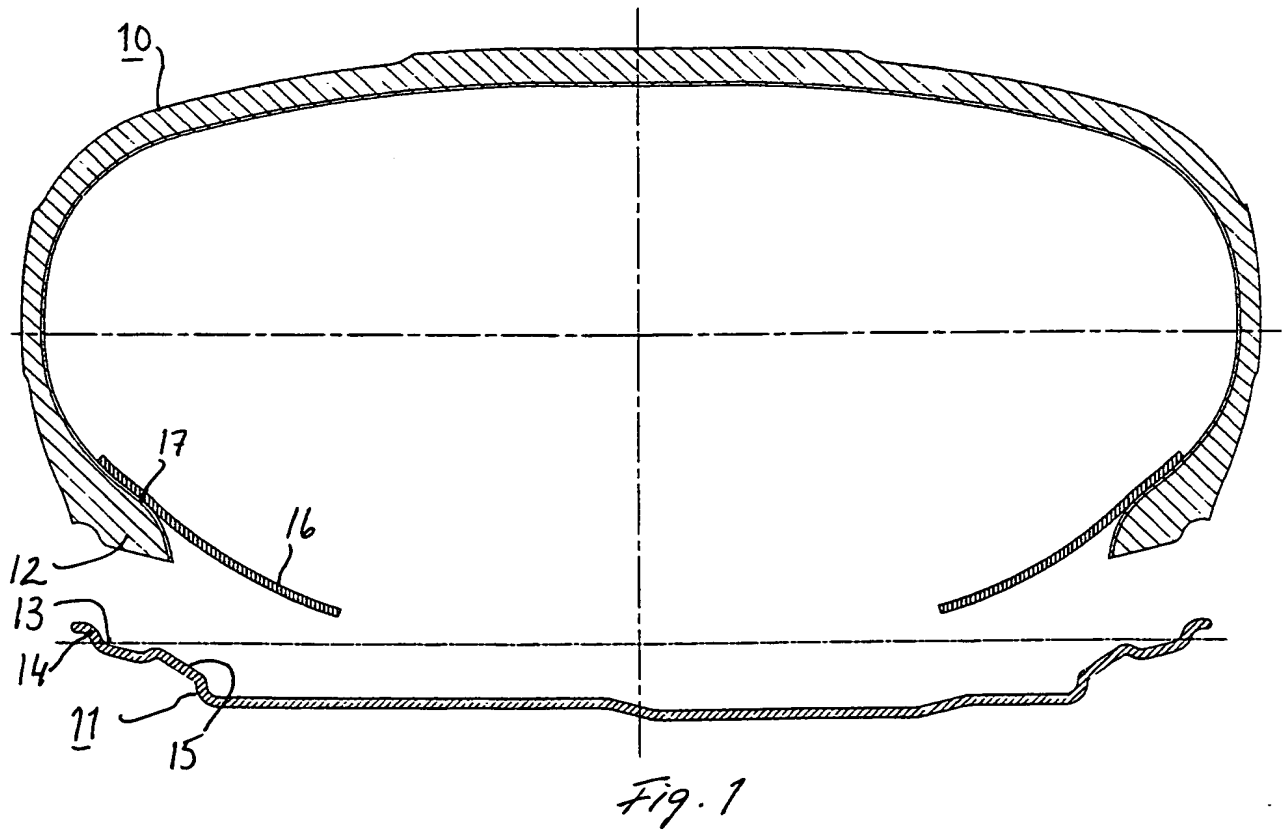
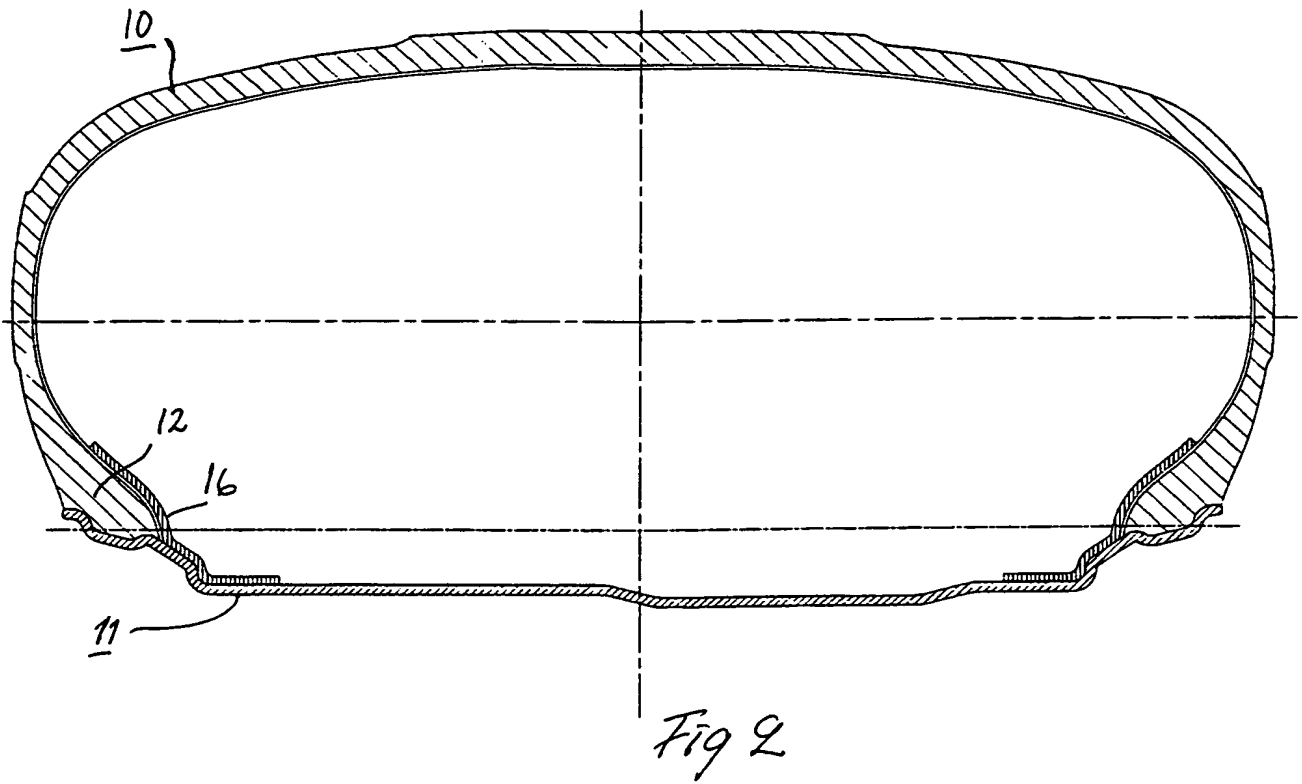
permanent gap between the edge 14 and the bead 12, the lip seal 16 will still provide an effective seal that prevents air from escaping from the tire 10.

## CLAIMS

1. An arrangement relating to pneumatic tubeless tires that are fitted with a tire bead (12) in sealing abutment with a rim seat (13) inwardly from a rim edge (14) on each side of an undivided rim (11), **characterised** in that the tire is provided with an internal lip seal (16), which is made of rubber or some like elastic material and which extends along the rim seat (13) inwardly from the tire bead (12); in that the outer part of the internal seal (16) proximal to the rim edge (14) is fastened to the tire bead (12) at a distance from its end; in that the inner part of the internal seal (16) proximal to the centre of the rim (11) has a circumference which is slightly smaller than the circumference of the rim (11) at this location; and in that the seal (16) is adapted to seal at least in the region of the abutment of the tire bead (12) with the rim seat (13) through the influence of the pneumatic pressure in the tire (10).
2. An arrangement according to Claim 1, **characterised** in that the outer part of the lip seal (16) is glued to the tire rim (2).
3. An arrangement according to Claim 1 or 2, **characterised** in that the lip seal (16) comprises a material of such softness as to cause the seal to lie in sealing abutment with its underlying supporting surface essentially along the whole of the extension of the seal.
4. An arrangement according to Claim 1 or 2, **characterised** in that the lip seal (16) is comprised of a relatively rigid elastic material and is adapted to lie in sealing abutment with the rim (11) at least at the inward part of said seal.
5. An arrangement according to any one of Claims 1-4, **characterised** in that the lip seal (16) is fastened with the edge of its outer part spaced from the end of the tire bead (12) by at least 50-70 mm.
6. An arrangement according to any one of Claims 1-5, **characterised** in that the lip seal (16) has a skirt-like configuration with the inner part of said seal resting loosely on the rim (11).

7. An arrangement according to any one of Claims 1-6, **characterised** in that the inner edge of the lip seal (16) has the form of a so-called selvage.

5 8. The use of the arrangement according to Claims 1-7 in low profile tires, preferably low profile tires intended for forestry service.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01173

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B60C 5/16, B60C 15/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B60C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2669276 A1 (CYCLES FERRAROLI-CH.), 22 May 1992 (22.05.92), figure 2, abstract --	1,2,3,5,6
X	CH 336278 A (GEORG FISCHER AKTIENGESELLSCHAFT, SCHAFFHAUSEN), 31 March 1959 (31.03.59), figure 1 --	1,2,3,5
X	WO 9821056 A1 (PACEMARK, INC.), 22 May 1998 (22.05.98), figure 3, abstract -- -----	1,2,4,5

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

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"&" document member of the same patent family

Date of the actual completion of the international search

7 Sept 2000

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Name and mailing address of the ISA  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Göran Carlström/js  
Telephone No. +46 8 782 25 00

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

08/05/00

International application No.  
**PCT/SE 00/01173**

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
FR	2669276	A1	22/05/92	NONE	
CH	336278	A	31/03/59	DE 1020882 B	00/00/00
WO	9821056	A1	22/05/98	AU 5255998 A	03/06/98